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SEQUENCE LISTING

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<120> ASSAY FOR IMIDAZOLINONE RESISTANCE MUTATIONS IN BRASSICA SPECIES

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tcgtcttctc cgatctcctt aaccgctaaa ccttcttcca aatcccctct acccatttcc     120

agattctccc ttcccttctc cttaaccccca cagaaaccct cctcccgtct ccaccgtcca     180

ctcgccatct ccgccgttct caactcaccc gtcaatgtcg cacctgaaaa aaccgacaag     240

atcaagactt tcatctcccg ctacgctccc gacgagcccc gcaagggtgc tgatatcctc     300

gtggaagccc tcgagcgtca aggcgtcgaa accgtcttcg cttatcccgg aggtgcctcc     360

atggagatcc accaagcctt gactcgctcc tccaccatcc gtaacgtcct cccccgtcac     420

gaacaaggag gagtcttcgc cgccgagggt tacgctcgtt cctccggcaa accgggaatc     480

tgcatagcca cttcgggtcc cggagctacc aacctcgtca gcgggttagc cgacgcgatg     540

cttgacagtg ttcctctcgt cgccatcaca ggacaggtcc ctcgccggat gatcggtact     600

gacgcgttcc aagagacgcc aatcgttgag gtaacgaggt ctattacgaa acataactat     660

ctggtgatgg atgttgatga catacctagg atcgttcaag aagcattctt tctagctact     720

tccggtagac ccggaccggt tttggttgat gttcctaagg atattcagca gcagcttgcg     780

attcctaact gggatcaacc tatgcgcttg cctggctaca tgtctaggct gcctcagcca     840

ccggaagttt ctcagttagg ccagatcgtt aggttgatct cggagtctaa gaggcctgtt     900

ttgtacgttg gtggtggaag cttgaactcg agtgaagaac tggggagatt tgtcgagctt     960

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gcgtttgcga gcagggctaa gattgtgcac atagacattg attctgctga gattgggaag    1200

aataagacac ctcacgtgtc tgtgtgtggt gatgtaaagc tggctttgca agggatgaac    1260

aaggttcttg agaaccgggc ggaggagctc aagcttgatt tcggtgtttg gaggagtgag    1320

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ccgcagtacg cgattcaggt cctagacgag ctaacccaag ggaaggcaat tatcagtact    1440

ggtgttggac agcatcagat gtgggcggcg cagtttttaca agtacaggaa gccgaggcag    1500

tggctgtcgt cctcaggact cggagctatg ggtttcggac ttcctgctgc gattggagcg    1560
```

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tctgtggcga accctgatgc gattgttgtg gacattgacg gtgatggaag cttcataatg     1620

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aacaaccagc atcttgggat ggtcatgcaa ttggaagatc ggttctacaa agctaacaga     1740

gctcacactt atctcgggga cccggcaagg gagaacgaga tcttccctaa catgctgcag     1800

tttgcaggag cttgcgggat tccagctgcg agagtgacga agaaagaaga actccgagaa     1860

gctattcaga caatgctgga tacacctgga ccgtacctgt tggatgtcat ctgtccgcac     1920

caagaacatg tgttaccgat gatcccaagt ggtggcactt tcaaagatgt aataaccgaa     1980

ggggatggtc gcactaagta ctgagagatg aagctggtga tccatcatat ggtaaaagac     2040

ttagtttcag ttttcagttt cttttgtgtg gtaatttggg tttgtcagtt gttgtactgc     2100

ttttggtttg ttcccagact tactcgctgt tgttgttttg tttccttttt cttttatata     2160
```

<210> 7
<211> 1994
<212> DNA
<213> Brassica napus

<220>
<221> modified_base
<222> (9)..(9)
<223> a, c, g, t, unknown or other

<220>
<221> modified_base
<222> (23)..(23)
<223> a, c, g, t, unknown or other

<220>
<221> modified_base
<222> (95)..(95)
<223> a, c, g, t, unknown or other

<220>
<221> modified_base
<222> (678)..(678)
<223> a, c, g, t, unknown or other

<400> 7

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aaaaaaccga caagatcaag actttcatct cccgntacgc tcccgacgag ccccgcaagg      120

gtgctgatat cctcgtggaa gccctcgagc gtcaaggcgt cgaaaccgtc ttcgcttatc      180
```

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ccggaggtgc ctccatggag atccaccaag ccttgactcg ctcctccacc atccgtaacg    240

tcctcccccg tcacgaacaa ggaggagtct tcgccgccga gggttacgct cgttcctccg    300

gcaaaccggg aatctgcata gccacttcgg gtcccggagc taccaacctc gtcagcgggt    360

tagccgacgc gatgcttgac agtgttcctc tcgtcgccat cacaggacag gtccctcgcc    420

ggatgatcgg tactgacgcg ttccaagaga cgccaatcgt tgaggtaacg aggtctatta    480

cgaaacataa ctatctggtg atggatgttg atgacatacc taggatcgtt caagaagcat    540

tctttctagc tacttccggt agacccggac cggttttggt tgatgttcct aaggatattc    600

agcagcagct tgcgattcct aactgggatc aacctatgcg cttgcctggc tacatgtcta    660

ggctgcctca gccaccgnaa gtttctcagt taggccagat cgttaggttg atctcggagt    720

ctaagaggcc tgttttgtac gttggtggtg gaagcttgaa ctcgagtgaa gaactgggga    780

gatttgtcga gcttactggg atccctgttg cgagtacgtt gatggggctt ggctcttatc    840

cttgtaacga tgagttgtcc ctgcagatgc ttggcatgca cgggactgtg tatgctaact    900

acgctgtgga gcatagtgat ttgttgctgg cgtttggtgt taggtttgat gaccgtgtca    960

cgggaaagct cgaggcgttt gcgagcaggg ctaagattgt gcacatagac attgattctg    1020

ctgagattgg gaagaataag acacctcacg tgtctgtgtg tggtgatgta aagctggctt    1080

tgcaagggat gaacaaggtt cttgagaacc gggcggagga gctcaagctt gatttcggtg    1140

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gagaagccat tcctccgcag tacgcgattc aggtcctaga cgagctaacc caagggaagg    1260

caattatcag tactggtgtt ggacagcatc agatgtgggc ggcgcagttt tacaagtaca    1320

ggaagccgag gcagtggctg tcgtcctcag gactcggagc tatgggtttc ggacttcctg    1380

ctgcgattgg agcgtctgtg gcgaaccctg atgcgattgt tgtggacatt gacggtgatg    1440

gaagcttcat aatgaacgtt caagagctgg ccacaatccg tgtagagaat cttcctgtga    1500

agatactctt gttaaacaac cagcatcttg ggatggtcat gcaattggaa gatcggttct    1560

acaaagctaa cagagctcac acttatctcg gggacccggc aagggagaac gagatcttcc    1620

ctaacatgct gcagtttgca ggagcttgcg ggattccagc tgcgagagtg acgaagaaag    1680

aagaactccg agaagctatt cagacaatgc tggatacacc tggaccgtac ctgttggatg    1740

tcatctgtcc gcaccaagaa catgtgttac cgatgatccc aagtggtggc actttcaaag    1800
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```
atgtaataac cgaaggggat ggtcgcacta agtactgaga gatgaagctg gtgatccatc    1860

atatggtaaa agacttagtt tcagttttca gtttcttttg tgtggtaatt tgggtttgtc    1920

agttgttgta ctgcttttgg tttgttccca gacttactcg ctgttgttgt tttgtttcct    1980

ttttctttta tata                                                      1994
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<210> 8
<211> 1950
<212> DNA
<213> Brassica napus

<220>
<221> modified_base
<222> (51)..(51)
<223> a, c, g, t, unknown or other

<220>
<221> modified_base
<222> (634)..(634)
<223> a, c, g, t, unknown or other

<220>
<221> modified_base
<222> (996)..(996)
<223> a, c, g, t, unknown or other

<400> 8
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accgtcttcg cttatcccgg aggtgcttcc atggagatcc accaagcctt gactcgctcc    180

tccaccatcc gtaacgtcct cccccgtcac gaacaaggag gagtcttcgc cgccgagggt    240

tacgctcgtt cctccggcaa accgggaatc tgcatagcca cttcgggtcc cggagctacc    300

aacctcgtca gcgggttagc cgacgcgatg cttgacagtg ttcctctcgt cgccatcaca    360

ggacaggtcc ctcgccggat gatcggtact gacgcgttcc aagagacgcc aatcgttgag    420

gtaacgaggt ctattacgaa acataactat ctggtgatgg atgttgatga catacctagg    480

atcgttcaag aagctttctt tctagctact tccggtagac ccggaccggt tttggttgat    540

gttcctaagg atattcagca gcagcttgcg attcctaact gggatcaacc tatgcgcttg    600

cctggctaca tgtctaggct gcctcagcca ccgnaagttt ctcagttagg tcagatcgtt    660

aggttgatct cggagtctaa gaggcctgtt ttgtacgttg gtggtggaag cttgaactcg    720
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agtgaagaac tggggagatt tgtcgagctt actgggatcc ctgttgcgag tacgttgatg      780

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actgtgtatg ctaactacgc tgtggagcat agtgatttgt tgctggcgtt tggtgttagg      900

tttgatgacc gtgtcacggg aaagctcgag gcgtttgcga gcagggctaa gattgtgcac      960

atagacattg attctgctga gattgggaag aataanacac ctcacgtgtc tgtgtgtggt     1020

gatgtaaagc tggctttgca agggatgaac aaggttcttg agaaccgggc ggaggagctc     1080

aagcttgatt tcggtgtttg gaggagtgag ttgagcgagc agaaacagaa gttcccgttg     1140

agcttcaaaa cgtttggaga agccattcct ccgcagtacg cgattcaggt cctagacgag     1200

ctaacccaag ggaaggcaat tatcagtact ggtgttggac agcatcagat gtgggcggcg     1260

cagtttttaca agtacaggaa gccgaggcag tggctgtcgt cctcaggact cggagctatg     1320

ggtttcggac ttcctgctgc gattggagcg tctgtggcga accctgatgc gattgttgtg     1380

gacattgacg gtgatggaag cttcataatg aacgttcaag agctggccac aatccgtgta     1440

gagaatcttc ctgtgaagat actcttgtta aacaaccagc atcttgggat ggtcatgcaa     1500

tgggaagatc ggttctacaa agctaacaga gctcacactt atctcgggga cccggcaagg     1560

gagaacgaga tcttccctaa catgctgcag tttgcaggag cttgcgggat tccagctgcg     1620

agagtgacga agaaagaaga actccgagaa gctattcaga caatgctgga tacacctgga     1680

ccgtacctgt tggatgtcat ctgtccgcac caagaacatg tgttaccgat gatcccaagt     1740

ggtggcactt tcaaagatgt aataaccgaa ggggatggtc gcactaagta ctgagagatg     1800

aagctggtga tcgatcatat ggtaaaagac ttagtttcag ttttcagttt cttttgtgtg     1860

gtaatttggg tttgtcagtt gttgtactgc ttttggtttg ttcccagatt tactcgctgt     1920

tgttgttttg tttccttttt cttttatata                                      1950
```

<210> 9
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 9
cacaagtctc gtgttataaa ac   22

```
<210> 10
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 10
cattgagtgc caaacatatg aa                                        22


<210> 11
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 11
catacctgtt ggatgtgata t                                         21


<210> 12
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 12
aaacaacaac agcgagtacg t                                         21


<210> 13
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 13
cacaagcctc gtgttataaa aa                                        22


<210> 14
<211> 23
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 14
cattgagtgc caaacattat gta   23

<210> 15
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 15
actcggagct atgggtttc   19

<210> 16
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 16
atccaacagg tacggtcca   19

<210> 17
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 17
tgggatggtc atgcaatg   18

<210> 18
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 18
cttgggatgg tcatgcaatt   20

<210> 19
<211> 2378
<212> DNA
<213> Brassica napus

<400> 19

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agattcgttt ctattcatcc ataattaata aaaaaaaaag accaaacaaa caaaaatcat      60

attccaaggg tattttcgta aacaaacaaa accctcacaa gtctcgtttt ataaaacgat     120

tcacgttcac aaactcattc atcatctctc tctcctctaa ccatggcggc ggcaacatcg     180

tcttctccga tctccttaac cgctaaacct tcttccaaat cccctctacc catttccaga     240

ttctcccttc ccttctcctt aaccccacag aaagactcct cccgtctcca ccgtcctctc     300

gccatctccg ccgttctcaa ctcacccgtc aatgtcgcac ctccttcccc tgaaaaaacc     360

gacaagaaca agactttcgt ctcccgctac gctcccgacg agccccgcaa gggtgctgat     420

atcctcgtcg aagccctcga gcgtcaaggc gtcgaaaccg tctttgctta tcccggaggt     480

gcttccatgg agatccacca agccttgact cgctcctcca ccatccgtaa cgtccttccc     540

cgtcacgaac aaggaggagt cttcgccgcc gagggttacg ctcgttcctc cggcaaaccg     600

ggaatctgca tagccacttc gggtcccgga gctaccaacc tcgtcagcgg gttagcagac     660

gcgatgcttg acagtgttcc tcttgtcgcc attacaggac aggtccctcg ccggatgatc     720

ggtactgacg ccttccaaga gacaccaatc gttgaggtaa cgaggtctat tacgaaacat     780

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cttgcgattc ctaactggga tcaacctatg cgcttacctg ctacatgtc taggttgcct     960

cagcctccgg aagtttctca gttaggtcag atcgttaggt tgatctcgga gtctaagagg    1020

cctgttttgt acgttggtgg tggaagcttg aactcgagtg aagaactggg gagatttgtc    1080

gagcttactg ggatccccgt tgcgagtact ttgatggggc ttggctctta tccttgtaac    1140

gatgagttgt ccctgcagat gcttggcatg cacgggactg tgtatgctaa ctacgctgtg    1200

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ctcgaggctt tcgctagcag ggctaaaatt gtgcacatag acattgattc tgctgagatt    1320

gggaagaata agacacctca cgtgtctgtg tgtggtgatg taaagctggc tttgcaaggg    1380
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atgaacaagg ttcttgagaa ccgggcggag gagctcaagc ttgatttcgg tgtttggagg   1440

agtgagttga gcgagcagaa acagaagttc cctttgagct tcaaaacgtt tggagaagcc   1500

attcctccgc agtacgcgat tcagatcctc gacgagctaa ccgaagggaa ggcaattatc   1560

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ataatgaacg ttcaagagct ggccacaatc cgtgtagaga atcttcctgt gaagatactc   1800

ttgttaaaca accagcatct tgggatggtc atgcaatggg aagatcggtt ctacaaagct   1860

aacagagctc acacttatct cggggacccg gcaagggaga acgagatctt ccctaacatg   1920

ctgcagtttg caggagcttg cgggattcca gctgcgagag tgacgaagaa agaagaactc   1980

cgagaagcta ttcagacaat gctggataca ccaggaccat acctgttgga tgtgatatgt   2040

ccgcaccaag aacatgtgtt accgatgatc ccaagtggtg gcactttcaa agatgtaata   2100

acagaagggg atggtcgcac taagtactga gagatgaagc tggtgatcga tcatatggta   2160

aaagacttag tttcagtttc cagtttcttt tgtgtggtaa tttgggtttg tcagttgttg   2220

tactactttt ggttgttccc agacgtactc gctgttgttg ttttgtttcc tttttctttt   2280

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tactagactg cgattatcta ctaatcttgc taggaaat   2378

<210> 20
<211> 2359
<212> DNA
<213> Brassica napus

<400> 20
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ccctcacaag cctcgtttta taaaaacgat tcacgttcac aaactcattc atcatctctc   120

tctcatttct ctctctctct catctaacca tggcggcggc aacatcgtct tctccgatct   180

ccttaaccgc taaaccttct tccaaatccc ctctaccccat ttccagattc tcccttccct   240

tctccttaac cccacagaaa ccctcctccc gtctccaccg tccactcgcc atctccgccg   300

ttctcaactc accgtcaat gtcgcacctg aaaaaaccga caagatcaag actttcatct   360

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cccgctacgc tccccgacgag ccccgcaagg gtgctgatat cctcgtggaa gccctcgagc    420

gtcaaggcgt cgaaaccgtc ttcgcttatc ccggaggtgc ctccatggag atccaccaag    480

ccttgactcg ctcctccacc atccgtaacg tcctcccccg tcacgaacaa ggaggagtct    540

tcgccgccga gggttacgct cgttcctccg gcaaaccggg aatctgcata gccacttcgg    600

gtcccggagc taccaacctc gtcagcgggt tagccgacgc gatgcttgac agtgttcctc    660

tcgtcgccat cacaggacag gtccctcgcc ggatgatcgg tactgacgcg ttccaagaga    720

cgccaatcgt tgaggtaacg aggtctatta cgaaacataa ctatctggtg atggatgttg    780

atgacatacc taggatcgtt caagaagcat tctttctagc tacttccggt agacccggac    840

cggttttggt tgatgttcct aaggatattc agcagcagct tgcgattcct aactgggatc    900

aacctatgcg cttgcctggc tacatgtcta ggctgcctca gccaccggaa gtttctcagt    960

taggccagat cgttaggttg atctcggagt ctaagaggcc tgttttgtac gttggtggtg   1020

gaagcttgaa ctcgagtgaa gaactgggga gatttgtcga gcttactggg atccctgttg   1080

cgagtacgtt gatggggctt ggctcttatc cttgtaacga tgagttgtcc ctgcagatgc   1140

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cgtttggtgt taggtttgat daccgtgtca cgggaaagct cgaggcgttt gcgagcaggg   1260

ctaagattgt gcacatagac attgattctg ctgagattgg gaagaataag acacctcacg   1320

tgtctgtgtg tggtgatgta aagctggctt tgcaagggat gaacaaggtt cttgagaacc   1380

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agaagttccc gttgagcttc aaaacgtttg gagaagccat tcctccgcag tacgcgattc   1500

aggtcctaga cgagctaacc caagggaagg caattatcag tactggtgtt ggacagcatc   1560

agatgtgggc ggcgcagttt tacaagtaca ggaagccgag gcagtggctg tcgtcctcag   1620

gactcggagc tatgggtttc ggacttcctg ctgcgattgg agcgtctgtg gcgaaccctg   1680

atgcgattgt tgtggacatt gacggtgatg gaagcttcat aatgaacgtt caagagctgg   1740

ccacaatccg tgtagagaat cttcctgtga agatactctt gttaaacaac cagcatcttg   1800

ggatggtcat gcaatgggaa gatcggttct acaaagctaa cagagctcac acttatctcg   1860

gggacccggc aagggagaac gagatcttcc ctaacatgct gcagtttgca ggagcttgcg   1920

ggattccagc tgcgagagtg acgaagaaag aagaactccg agaagctatt cagacaatgc   1980
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tggatacacc tggaccgtac ctgttggatg tcatctgtcc gcaccaagaa catgtgttac   2040

cgatgatccc aagtggtggc actttcaaag atgtaataac cgaaggggat ggtcgcacta   2100

agtactgaga gatgaagctg gtgatccatc atatggtaaa agacttagtt tcagttttca   2160

gtttcttttg tgtggtaatt tgggtttgtc agttgttgta ctgcttttgg tttgttccca   2220

gacttactcg ctgttgttgt tttgtttcct ttttctttta tatataaata aactgcttgg   2280

gtttttttac ataatgtttg ggactcaatg caaggaaatg ctactagact gcgattatct   2340

actaatcttg caaggaaat                                                 2359
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